

ED-US030965

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Attn: Mail Stop AF
Yoshinobu FUKUDA et al.	:	Patent Art Unit: 3655
Serial No. 10/583,998	:	Examiner: Richard M. Lorence
Filed: June 22, 2006	:	Confirmation No. 3377
For: MULTI-PLATE CLUTCH DEVICE AND	:	
CLUTCH DISK ASSEMBLY.	:	

AFFIDAVIT UNDER 37 CFR §1.132

Assistant Commissioner of Patents
Washington, DC 20231

Sir:

I, Hideaki Namba, being duly sworn, depose, and state:

1. I received a B.S in Transportation Mechanical Engineering from Osaka Sangyo University in Japan in 1992.
2. I have been employed by Exedy Corporation since 1992, and am in charge of designing clutch devices.
3. I supervised the experiments and created the chart to the left of the heading "LONG LIFE DESIGN" (hereinafter long life chart) and the chart within the box entitled "EASY TO HANDLE WHILE HIGH TRANSMISSION FORCE IS BEING MAINTAINED" (hereinafter handling chart) on the pages of the Exedy Corporation brochure (Exhibit A) submitted herewith.
4. The long life chart and the handling chart accurately represent the results of experiments conducted by Exedy Corporation.
5. As shown in the long life chart, semi-carbon clutches, e.g., clutches in which the friction plates are made of a carbon composite material and the flywheel/input rotor and pressure plate are made of metal containing iron as the main ingredient or steel, have more than twice the life expectancy of conventional metallic type clutches, and more four times the life expectancy of full carbon clutches that do not use oversized plates.

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Affidavit in Reply to Office Action of February 23, 2010

6. As shown in the handling chart, at lower temperatures, the semi-carbon clutches have a low friction coefficient and at higher temperatures have a much higher friction coefficient.

Hideaki Namba June 18, 2010
(Signature Date)

Hideaki Namba

S:\06-JUN10-SOS\ED-US030965 Affidavit.doc

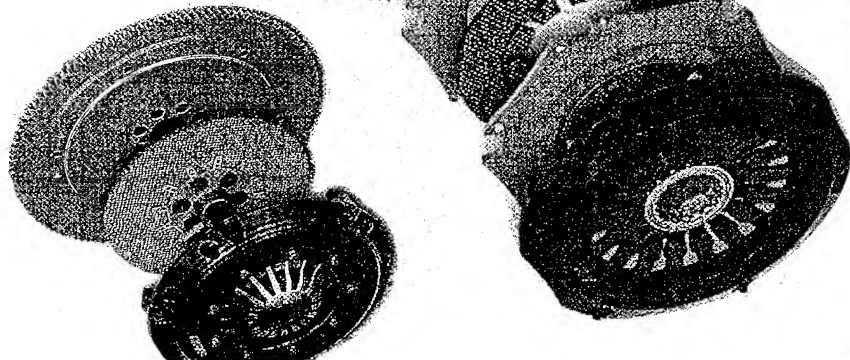
EXHIBIT A

Carbon Series

PROPER WARM UP PROCEDURE

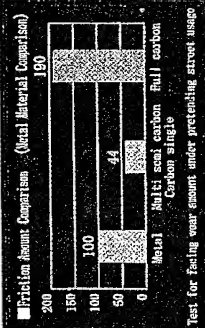
Due to the inherent properties in the warm up procedures of the carbon material we must specify the proper way to get the discs up to operating temperature. This process will heat the discs so that they will hold the specified torque ratings.

The correct method for heating up an Exedy Carbon Clutch is three, five second "slips" of the clutch within 30 seconds. This process may seem excessive but is necessary when producing such high power levels.



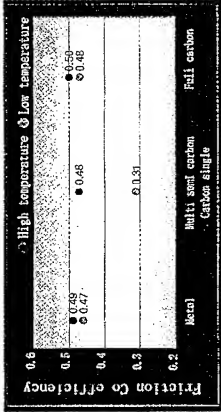
LONG LIFE DESIGN

Semi-Carbon clutches allow double life when compared to conventional metallic type material, which equates to an improved cost performance thanks to longer overhaul cycles. Full carbon clutches have more wear than metallic however when used with oversized pressure plates, the life is identical to metallic.



EASY TO HANDLE WHILE HIGH TRANSMISSION FORCE IS BEING MAINTAINED.

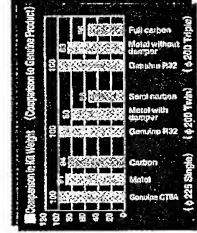
By Controlling the carbon fibers baking temperature the cross layer type carbon material which is the most appropriate for high revolution strength and high torque transmission, is applied to tuning car clutches. Full carbon clutches encompass lightweight, high heat resistance and a stable friction coefficient. Semi carbon clutches incorporate all features of carbon material, with the friction coefficient being effected by temperature. Exedy carbon clutches are tuned so that at a lower temperature, engagement feeling is improved and conversely at high temperatures engagement is ideal for sporty driving. In any type of driving, the carbon clutches offer excellent operational feel.



LIGHT WEIGHT AND LOW INERTIA TO ENABLE SUPERIOR SHIFT FEELING

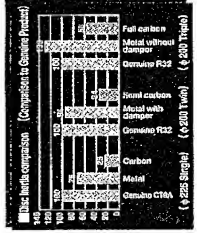
<LIGHT IN WEIGHT>

The heaviest components of the clutch system are the clutch cover, plates and flywheel. Full carbon clutches utilize carbon clutch and intermediate plates achieving a reduction in total weight. Semi-Carbon clutch incorporate an improved cover configuration and lightened flywheel also enabling a reduction in vehicle weight.



<LOW INERTIA DESIGN>

The weight of a carbon clutch disc is one third that of a metallic disc. Utilizing a high friction coefficient Hyper Carbon Disc, we are able to reduce the disc diameter reducing inertia, enabling quick shift response.



INTRODUCING...

THE FLAGSHIP MODEL OF EXEDY RACING CLUTCHES; THE CARBON STEEL MULTI PLATE CLUTCHES. THE CLUTCHES ARE LIGHT IN WEIGHT, DURABLE AND RESILIENT TO HIGH HEAT, CONTRIBUTING TO AN IMPROVEMENT IN TRACK TIMES.

BOLT ON DESIGN

Complete bolt on designs that require no additional modifications. Costs can be controlled and there is no need to worry about parts failure.

HIGH HEAT RESISTANCE

Carbon materials are baked at more than 2,000 degree Celsius which allows the carbon material to dissipate heat far better than conventional metallic material. Heat expansion rate is 1/20th of iron therefore eliminating feeling change and disengagement performance change that may happen due to distortion caused by expansion during driving. Carbon Material not only has a high heat resistance but also a "nonstick" characteristic that eliminates disengagement.

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